

### IN THE SPECIFICATION

Please replace the paragraph beginning at page 6, line 6 with the following replacement paragraph marked to show changes made:

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B' -- A system and a method for debugging a microcontroller code while debugging process is in progress. A line of code of a plurality of lines of code is executed by a production microcontroller producing a first value. The line of code of the plurality of lines of code is synchronously executed by an ICE and producing the second value. The first value is sent to the ICE. ICE compares the first value and the second value and if the result of the comparison is a mismatch it issues a "lock-step error". When ~~a~~ a "lock step error" ~~issued~~ issues, a user traces a trace buffer, residing in the ICE, and locates the line of code causing the mismatch and debugs the faulty line of code. -

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Please replace the paragraph beginning at page 13, line 20 with the following replacement paragraph marked to show changes made:

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B<sup>2</sup> -- In the embodiment described in connection with FIGURE 2, the actual production microcontroller 232 carries out its normal functions in the intended application and passes I/O information and other information needed for debugging to the base station 218 only at a break point or when in halt state. The virtual microcontroller 220 implemented within the FPGA of base station 218 serves to provide the operator with visibility into the core processor functions that are inaccessible in the production microcontroller 232. Thus, the FPGA 220, by virtue of operating in lock-step operation with the microprocessor

b<sup>2</sup>  
cont  
232 provides an exact duplicate of internal registers, memory contents, interrupt vectors and other useful debug information. Additionally, trace buffer 226 can be used to store information useful in trace operations that is gathered by the FPGA 220 during execution of the program under test. This architecture, therefore, permits the operator to have visibility into the inner working of the microcontroller 232 without need to provide special boundouts and expensive circuitry on the microcontroller itself. --

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Please replace the Abstract with the following replacement Abstract marked to show changes made:

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~~-- A system and a method for checking~~ Checking the consistency of a lock step process while debugging a microcontroller code is in progress. A ~~system where a production microcontroller is partially copied in an ICE, to form a virtual microcontroller, and the ICE, where the ICE is not connected to an I/O bus. The production microcontroller and the virtual microcontroller simultaneously and independently run a microcontroller code in a lock step for debugging. The~~ A method provides ~~the~~ a production microcontroller to execute an instruction code and provides the result of the instruction code to ~~the~~ an ICE. The ICE, independent from the production microcontroller and simultaneously, executes the same instruction code and produces a result. The ICE compares the result of its computation and the result received from the production microcontroller. The ICE issues a "lock step error" when the result of the comparison is a mismatch. A trace buffer residing in the host device provides the location of the line of code causing the mismatch. After identifying the line of

*B<sup>3</sup>  
cont*

code causing the mismatch the user debugs the erroneous line of code. The debugging process resumes on the next line of code in the microcontroller code under test. --

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